

Solar Wind Turbulence from the Near-Sun Environment to Earth

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In this talk, I discuss advances in our understanding of the role turbulence plays in shaping the evolution of the solar wind as it propagates from near the Sun to 1 au. This understanding is driven both by numerical simulations of Alfvénic turbulence that study the mechanisms through which the electromagnetic fields transfer energy to the charged particles through the implementation of method such as the field-particle correlator (Klein et al., 2017, 2020) as well as novel in situ measurements of the plasma at unprecedented distances close to the Sun (Vech et al., 2021; Klein et al., 2021). Changes in the nature of the turbulence as the solar wind plasma expands into the heliosphere, and the different processes that are driven by this expansion, are discussed, as well as open questions regarding the nature of this Alfvénic turbulence that should be addressed over this next decade with the next generation of spacecraft missions, for example with the proposed HelioSwarm mission concept (Klein et al., 2019).

References

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